

to the war were fatal to it. The ballast heaps brought in from the Baltic of course ceased; owing to the shipping shortage and difficulties of navigation no vessels came in with ballast. Secondly, it is more than probable that the colony was re-enforced from time to time in a new ballast dumping until this ceased with the war.

Its disappearance was comparatively sudden, I have a dozen specimens I obtained from Bernard Harwood which he got, with as many others as he wanted, from John Gardner in 1907. I did not get these from Bernard until 1927, and I told him quite fairly that the moth was probably now extinct as a British insect but he did not mind or even put up the price, perhaps because we were friends. The reference to this species in Ford (1949) was almost certainly obtained from me: although he put in the cautionary "perhaps", Ford and I used to collect micros together about once a fortnight from 1922-1927, and I remember his visiting me during Corder's stay at Blean. — H. C. HUGGINS, 65 Eastwood Boulevard, Westcliff-on-Sea, Essex.

GREEN ISLANDS OF THE NEPTICULIDAE. — I welcome Mr. E. H. Wild's clear and neat explanation for the presence of green islands in autumnal leaves which are mined by nepticulid larvae (*Ent. Rec.*, 88: 103). I was present when he gave this explanation at the meeting of the B.E.N.H.S. to which he refers and listened with great interest. Nevertheless, I felt constrained to write in Volume I of *The Moths and Butterflies of Great Britain and Ireland* that the cause of the green islands had never satisfactorily been explained because his theory does not cover all the facts. Let me demonstrate this by describing what happens in oak leaves when mined by *Ectoedemia subbimaculella* (Haworth), a green-island species common in the south-east of England.

The moths fly in June and July and it is reasonable to suppose that the eggs are laid about the beginning of the latter month. I do not know precisely when the larvae hatch because at first they are so tiny that it would be idle to search for them. When young, the larva feeds in a narrow gallery closely following a rib, generally the midrib. This feeding has certainly started well before any autumnal changes occur in the leaves and I have occasionally chanced on these minute mines in September. Towards the end of October the larva, now in its last instar, extends its narrow gallery into a wide blotch, generally at an angle of veins; however, the growth of the larva is still slow and many individuals continue feeding within their blotch long after the leaves have fallen, often up to or beyond the end of November. It is in November, and especially in these fallen leaves, that the green islands are most conspicuous.

Ecdysis is a critical time for larvae and in the case of *E. subbimaculella* many die at this juncture, while still in their narrow galleries and before visible autumnal changes have started in the leaf. Now it makes no difference to the development of the green island whether the larva is alive or dead (I

am speaking loosely when I say "development": I realise that the development or change is really in the rest of the leaf). This cuts out larval respiration and the decay of frass as causes of the green island. Is it possible that the decay of the body of the dead larva, which is still microscopic, can be solely responsible for that big green island? The larval corpse quickly dries up and, remember, death occurred before the leaf began to assume its autumn colouration. Furthermore, as Mr. Wild rightly states, "when the larva vacates the mine the island soon vanishes". To this I must add that when a larva dies in a late November mine, the island vanishes equally quickly: the presence of the corpse does not prolong the life of the island. So it seems to me that the green island is caused by something which has occurred while the leaf is still green, very early in the life of the larva.

Mr. Wild is wrong in attributing the waterlogging of mines of *Ectoedemia intimella* (Zeller) to larval respiration. He has overlooked my statement that such waterlogging occurs in *fallen* leaves; it is not present in leaves which remain on the tree. The fallen leaves often lie in soaking-wet grass and the water may have gained access to the mine through accidental damage to the leaf's epidermis or through the stomata which Mr. Wild describes as being left open while the leaves are withering.

Another species which feeds in a green island is *Ectoedemia argyropeza* (Zeller) on aspen. Let me quote from my description of its mine in M.B.G.B.I.: "The larva at first mines the petiole immediately below the leaf causing it to swell slightly. Later it eats into the leaf, making a triangular blotch on one side of the midrib. The frass at first forms walls to a passage-way leading to the cavity in the petiole, into which the larva retreats backwards while it is small enough to do so. When the leaves turn yellow in the autumn, the mined section remains bright green. . . ." The green island forms a triangle extending far into the leaf with the larva and walls of frass at the apex. If frass and larval respiration were significant, why does the part of the leaf closest to the larva and in contact with the frass wither and why does the green island project so far away from the larva in the direction in which it is heading?

A consideration of green islands should include these which surround galls such as the nail galls common on beech leaves in the autumn. Can water, carbon di-oxide and salt emanate from such a gall or its occupant to the surrounding part of the leaf? Having been educated in the classics and not the sciences, I do not know; I can only state the facts and invite the scientists to explain them. This I hope Mr. Wild will do, demonstrating that his theory is incomplete rather than inaccurate. I suggest he focuses his attention on what is happening within the leaf a month or so before the onset of autumn colouration. — A. M. EMMET, Labrey Cottage, Victoria Gardens, Saffron Walden, Essex.